To Tunnel or Not to Tunnel?

A C&O Canal Building Dilemma

It is April 1836, and the building of the Chesapeake and Ohio Canal from Georgetown, Washington, D.C to Cumberland, Maryland continues. Your name is Lee Montgomery and you are an engineer[1] for the Chesapeake and Ohio Canal Project. You have been helping build the canal for many years. This is the same canal for which John Quincy Adams, our sixth president, held a groundbreaking ceremony on July 4, 1828 in Georgetown. Now, ten years later, an important decision must be made about the building of the Chesapeake and Ohio Canal.

Near a small town called Paw Paw, the Potomac River, which provides water for the C&O Canal, takes three huge back and forth loops across the land. The banks along these loops are steep and treacherous[2]. It will be very difficult for the workers to dig out the canal along the banks of the Potomac River like they have been doing since Georgetown. The loops are a total of five miles long and building the canal along the Potomac River will take about two years.

After looking at the geography of the land, you also believe that you will need to build at least three locks to help lift the boats up and down where the land rises and falls in elevation. Each lock costs about fifteen thousand dollars. To build the canal and all of these locks you estimate it will cost about $150,000. You are certain that while this work will be difficult, it will be successful and will allow boats to travel easily in both directions from Cumberland to Georgetown.

To avoid the long and difficult five mile loops of the Potomac River, you consider building a tunnel through the nearby Paw Paw Mountain. The tunnel would be much shorter, only 3/5 of a mile (3,118 feet) long, and would not require any expensive locks. However, from your past experience as an engineer you know that building a tunnel is slow and dangerous work. Tunnels usually take at least two years to build, and some tunnels take over ten years to build. You are certain this tunnel will take at least five years to build since you have to dig through the solid shale rock that makes up the Paw Paw Mountain. To remove all of the rock you will need to use dynamite which is very dangerous and can easily injure your workers.

---

[1] A person who designs and builds structures such as buildings and bridges

[2] Dangerous

The last time you helped build a tunnel you witnessed multiple cave-ins[3] that injured and even killed some of the workers. You know that tunnels are extremely expensive to build and can cost over $200,000 to complete. Because of how difficult it will be to build the tunnel, you are certain there will only be room for boats to travel in one direction at a time through the tunnel. Lastly, you know that if you are successful at building this tunnel, you will be seen as one of the greatest engineers of all time.

[3] When the roof of a mine or tunnel collapses or falls in

To Tunnel or Not to Tunnel: A C&O Canal Building Dilemma

Directions: Answer the following questions to determine the best option. There are two options.

Option 1: Build the canal along the river

- ✓ What are the pros (good things) about building the canal along the river?

- ✓ What are the cons (bad things) about building the canal along the river?

- ✓ Besides the ones stated in the dilemma, what are some other possible consequences and/or considerations you need to keep in mind before choosing this option?

Option 2: Build a tunnel

- ✓ What are the pros (good things) about building a tunnel?

- ✓ What are the cons (bad things) about building a tunnel?

- ✓ Besides the ones stated in the dilemma, what are some other possible consequences and/or considerations you need to keep in mind before choosing this?

What choice will you make?

Why do you believe this is the best choice?